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Updates:

Database Foundations

2-5

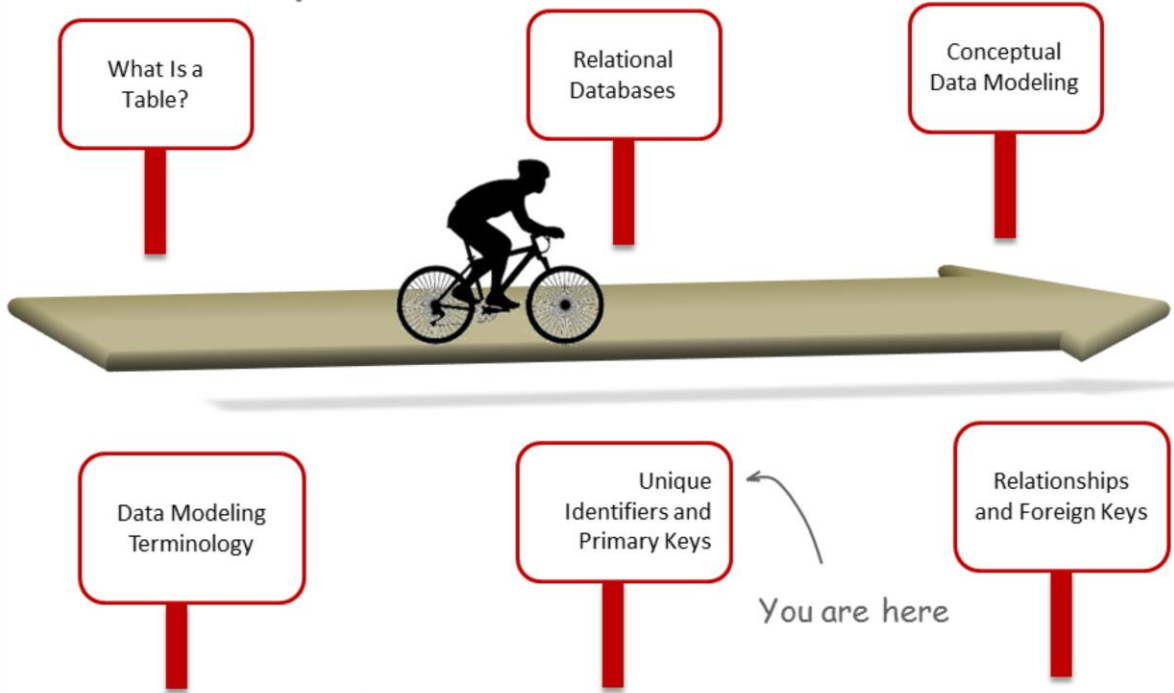
Unique Identifiers and Primary Keys



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Roadmap



Objectives

This lesson covers the following objectives:

- Identify unique identifiers
- Identify the corresponding primary keys



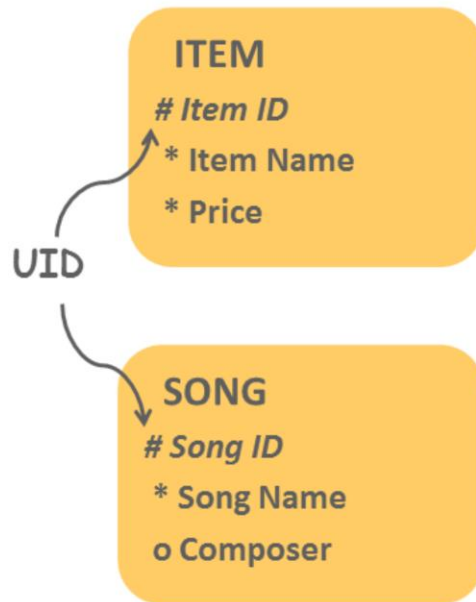
Conceptual Data Model UID

- A UID is an attribute of an entity that is unique across all instances of the entity.
- It has a non-NULL value for each instance of the entity for the lifetime of the instance.
- Its value never changes over the lifetime of the instance.
- A UID is diagrammed with a number sign (#).

In a conceptual data model, a UID is the value or combination of values that enables the user to find that one unique item among all the rest. Identifying just the right attribute, the combination of attributes, and the relationships is a skill that any database designer must master. The UID is the way to find your record in a file, a particular card in a deck of cards, your package in a warehouse, and a specific piece of data in a database.

The UID is important because it designates which instance of an entity is being dealt with. Identifier selection is critical because it is also used to model relationships.

Unique Identifier: Example



In the slide example, the UID for **ITEM** is Item ID, and the UID for **SONG** is Song ID. The ID is represented by the number sign (#).

Similarly, when these entities are converted to the **ITEMS** table and the **SONGS** table, Item ID and Song ID become the primary keys for the respective tables.

Primary Key

- A primary key (PK) is a column or set of columns that uniquely identifies each row in a table.
- It cannot contain null values.
- A PK is either an existing table column or a column that is specifically generated by the database according to a defined sequence.
- It must contain a unique value for each row of data.



A primary key is a special relational database table column (or combination of columns) designated to uniquely identify all table records. The PK concept is critical to an efficient relational database. Without PK and closely related foreign key concepts, relational databases would not work.

For example, a database must hold all data stored by a commercial bank. Two of the database tables include `CUSTOMER`, which stores basic and static customer data (for example, `customer_id`, name, date of birth, address, and Social Security number) and `ACCOUNTS`, which stores various bank account data (for example, account creation date, account type, withdrawal limits, or corresponding account information).

Primary Key: Example

EMPLOYEES

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	.....	DEPARTMENT_ID
100	Steven	King	....	90
101	Neena	Kochhar	....	90
201	Rick	Bel	....	90
205	Shelly	Higgins	....	10
300	Bill	Steveward	....	110

↑
Single-Column PK

The slide shows an example of a primary key.

Case Scenario: Identifying Unique Identifiers



In this case scenario, Sean, the student, needs to identify the entity UIDs for the simplified library database.

Case Scenario: Identifying Unique Identifiers



Sean identifies the entity UUIDs for the simplified library database. They are:

- BOOK_ID
- MEMBER_ID
- AUTHOR_ID
- PUBLISHER_ID
- TRANSACTION_ID

Composite UID and Primary Key

- A composite UID is a combination of attributes.
- A composite primary key is any key that consists of two or more columns.
 - Example: If a product is uniquely identified by its model number and revision code, the combination of the model number and revision code is a compound primary key.


Sometimes a single attribute is not enough to uniquely identify an entity instance. If the UID is a combination of attributes, it is called a composite UID.

Composite primary keys occur when the table uses more than one column to make up a primary key.

Composite Primary Key: Example

ACCOUNTS

BANK_NO	ACCT_NO	BALANCE	DATE_OPENED
104	71432	12,000	29-Oct-90
104	34578	18,000	12-Sep-85
105	78967	20,000	
103	96545	60,000	04-Aug-91
105	72345	10,000	03-Jan-99


These fields are combined to form a compound PK.

The slide shows an example of a composite primary key.

Summary

In this lesson, you should have learned how to:

- Identify UUIDs
- Identify the corresponding primary keys





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